

## Chapter Seven

# Descartes and Mastery of Nature

### 1

The common judgment is that Francis Bacon is the originator of the concept of “mastery of nature,” which is so indispensable in the technological crisis of this century. Attempts to trace the Baconian concept to anterior origins in Renaissance magic or Christian theology have touched upon but one or two aspects of his argument, which is moreover an indelibly philosophical one. On the other hand, the concept has never proved central to the interpretation of Descartes, the generally acknowledged “founder of modern philosophy.” It is often noted, to be sure, that Descartes in a celebrated passage in *Discourse* 6 advocates the replacement of “the speculative philosophy of the Schools” by “a practical [philosophy]” which will make us “like masters and owners of nature.”<sup>1</sup> But nowhere else does this phrase, or a similar one, occur in the Cartesian writings, whereas in Bacon’s works the mastery concept is ubiquitous. The *Meditations*, Descartes’s central philosophic writing, asserts in its title and in its preface its place in the traditions of speculative “first philosophy” and Christian apologetics. We have no weighty efforts to bring its metaphysical doctrines into significant connection with the mastery concept of the *Discourse*. Historians may observe the importance of *scientia propter potentiam* for Hobbes, but they do not stress mastery of nature as a thematic goal of modern philosophy. The influence of Baconian “mastery” remains dormant, it is usually held, until the sciences break away from their philosophic parentage, and develop their technological potential—most obviously in the nineteenth century. Among the philosophers of our century, Dewey is altogether rare in identifying the mastery concept as goal of philosophy and humanity; he traces it to Bacon and passes over Descartes. In sum, the power of

the Baconian mastery goal is exerted only within the sciences, but only in a puzzling and delayed manner, and scarcely at all on the course of modern philosophy. Accordingly, there is scarcely any valuable research on the Baconian or seventeenth-century origin of that modern technological humanitarianism, so powerful for good and evil, which has made the human future incalculable in unexampled degree.

"Mastery of nature" is today the enterprise of advanced technological societies, singly and within the world scientific community, within which it is difficult to affix responsibility among the interconnected agencies and factors. Yet the one indispensable element must be located in its theoretical component—in what Hans Jonas has called "the new concept of *nature* [which] contained manipulability at its theoretical core."<sup>2</sup> Here we have to do with the mathematical and experimental theory of modern physics. Bacon indeed propounded the mastery goal, opposed the speculative tradition with argument unrivaled in scope and force, and recognized that experimentation was more precise than unaided sense perception, but the mathematical instrument it was to employ was unknown and even alien to his empiricism. It is rather Descartes who implants "mathematicism" in the heart of philosophy and science. To him we owe "analytic geometry" and "universal mathematics," the law of inertia, and the elaboration of a model of nature more comprehensive than that of Hobbes, in which the "rules of mechanics are the same as those of nature" (*Discours*, 52). Moreover, it has never proved possible to separate the metaphysical doctrine of Descartes, especially his substantial dualism, from close dependence on, or close complementarity with, his mathematicism and mechanistic physics. The question therefore must arise with which we are here concerned. Can mastery of nature be regarded as an intrinsic and guiding objective of Cartesian philosophy—and therewith of the problems and structure of the tradition of which he is the principal founder? The textual paucity of the phrase "mastery of nature" presents little obstacle. The one passage that turns on this phrase is the most explicit and complete treatment of the nature of philosophy in the Cartesian writings.

We must first indicate the measure in which Bacon established a framework within which to consider Cartesian mastery of nature. Bacon's starting point, often reiterated, is that "the greatest error of all the rest is the mistaking or misplacing of the last or farthest end of human knowledge."<sup>3</sup> His positive endeavor is that "contemplation and action may be more nearly and straitly conjoined and united together than they have been" (*Advancement*, 35). "Contemplation" (or "speculative philosophy") here means the quest for knowledge of the first or abiding beings or principles, whether further practical consequences are present or not. This conjoining, which suggests a synthesis in which contemplation and action are each given due weight,

a rejection of the contemplative goal simply, and a reinterpretation of it with a view to "action." The formulae of the new goal resound throughout the modern period: "Human knowledge and human power meet in one"; "dominion of the human race itself over the universe" for the alleviation of man's mortal condition.<sup>4</sup> The repetitive sterility and barren disputatiousness of the contemplative tradition is contrasted with the steady progress of the arts. Even though some inventions have served human oppression—gunpowder, the compass are instanced, but not the printing press—and perhaps all contain that possibility, they are instruments and models for that comprehensive art of investigating nature in which alone the ultimate victory over evil can be found. Mastery of nature has both the character of an impetuous wager, and a somber, reasoned deliberation. Bacon's powerful formulae are rhetorical instruments of an appeal to humanity that has tended to conceal the underlying deliberation. No philosopher more openly declared that philosophic speech must combine, in the same writing, open and public address with a less visible discourse addressed to those of philosophic capacity.<sup>5</sup> His formulae are popular expressions of the conclusions of his deliberation. What is at stake in this wager concerns both the public and philosophy because it demands that humanity, using philosophy or science as its instrument, seize control of its own destiny, instead of allowing philosophy to turn its back on humanity by contemplating the transhuman, eternal order. As regards the speculative tradition, if the "forms" discovered by the Platonic and Aristotelian philosophies were truly the efficient causes of the generation or destruction of at least some beings, some human works would have ensued. Their consequence has been barren. Hence no reflection on speculative philosophy from within its own intention is required. It seemed reasonable to conclude that a theory that has led, directly or indirectly, to no human production, while pretending to know first causes, is less genuinely knowledge than that which produces works as evidence for theory, even if not theory of first causes. It seemed reasonable to wager that a truly universal goal that conjoined theory and practice, the interests of philosophy and of humanity without exclusion, could be the engine that carried theory to new heights.

Bacon's endeavor is best understood as a critique of the antihumanitarianism or nonhumanitarianism of ancient political philosophy. The Platonic Socrates tells us in *Republic* 5 that unless philosophers rule as kings, or kings seriously cultivate philosophy, there is no rest from ills for the cities, nor for humankind, nor will the best regime come forth from nature and see the light of the sun. This proposal is the peak of Greek philosophy's care for humanity. By the end of *Republic* 7 it has been shown to be impossible, or extremely unlikely, and even undesirable or unnatural in certain respects.

The goals of philosophy and humanity are separated by the greatest of differences; the philosophers are enamored of the contemplation of the whole or of the first or that which abides; the multitude do not philosophize. The coincidence of philosophy and political rule would require the coincidence of the perfections of virtue and knowledge, of natural philosophic endowment and social and material conditions, and such coincidences are always subject to chance. The supreme humanitarian solution must exist then only "in speech," or only "in imagination"—in the phrase of Machiavelli which Bacon takes over. "As for the philosophers, they make imaginary laws for imaginary commonwealths; and their discourses are as the stars, which give little light, because they are so high" (*Advancement*, 206). Bacon declares that he is "much beholden" to Machiavelli who teaches us to observe the low and universal, or almost universal: what men do and not what they ought to do. The mastery of *fortuna*, nature, or chance of Machiavelli's *Prince* (especially chapter 25) is imitated by "the architecture of fortune" in *The Advancement of Learning*; what seems restricted to mastery of human nature is extended by Bacon to "lordship over the universe" in *New Organon* 1.129. The imaginary politics of Greek philosophy (here must be included the best regime of Aristotle's *Politics*, which is also dependent on chance) is not only useless but dangerous: its nonhumanitarian goal made it vulnerable to the equally or more "imaginary" politics of religion. It became the subordinate "handmaid" to revealed theology in the Christian Middle Ages. Nonhumanitarian philosophy shows itself as antihumanitarian philosophy; neutrality is impossible: if philosophy pretends to be the impartial spectator of the human fate within some eternal order it falls prey to the imperfect humanitarianism of religion. Bacon sought to conjoin the speculative quest for the true nature of Greek philosophy with what he called "charity"—the care for humanity of the most universally received religion. This syncretism underlies the more fundamental syncretic union of philosophy and politics in Bacon's thought: a particular polity (for example, the New Atlantis) or, in the best case, a universal politics that sanctions and propagates the mastery of nature, is the necessary condition of the fulfillment of its humanitarian promise.

What we have called syncretism is often misunderstood as "secularized Christianity." It is true that Bacon claims that mastery of nature is a privilege granted to Adam and to his posterity in the Garden. It is reasonable to conclude that that argument is directed to those who accept biblical premises: his more sustained argument is independent of those premises. He contends that knowledge of nature is divinely sanctioned, so long as it is governed by charity, but that knowledge of good and evil was forbidden to Adam as an object of inquiry. Good and evil in general, and charity in particular, are

known by divine command, or by the Word of God; by the extension of charity Bacon purports to bring the fruits of the mastery of nature under divine command. By such a secularization, it is alleged, Bacon pours into the old bottles of Christian virtue the new wine of modern technology. Our wonder at this feat is aroused, however, when we consider the indefinitely long life, devoid of toil and replete with luxury, that Baconian mastery of nature holds out to mankind. But the secularization thesis collapses when knowledge of good and evil by divine command is openly replaced by knowledge of good and evil "nourished by natural philosophy" which furnishes principles to "moral and political philosophy" (*New Organon* 1.80), although this is a promise for the future. As for the present, since Baconian philosophy is addressed to mankind and not Christianity or Christian Europe, its premises are laid not in Christian charity but in the universal human appeal of bread, freedom from natural necessity, and bodily longevity. Consequently, it is not Christian doctrine but Baconian philosophy that controls the mixture of syncretic elements in the *New Atlantis* in which Christianity and the Bible are combined with elements of Persian and Egyptian religion. Yet this religious syncretism is but a part of the underlying "humanistic" syncretism of philosophy and politics.

That "human knowledge and human power meet in one" does not entail the literal coincidence of philosophy or science and political power. Bacon leaves it ambiguous whether or not the philosophic rulers of the research institute, Solomon's House, are identical with the political rulers of the *New Atlantis*. Bacon thereby respects the Platonic heterogeneity of philosophy and politics, even within their conjunction. Philosophy's domination employs the indirect means of rhetoric and "works" or technology. The political power of philosophic mastery of nature lies initially in its prophecy of irresistible benefits, and subsequently in the fulfilled prophecy of those same benefits, which permits further exercise of prophecy. Its power resides in the desires of "men as they are" and the rhetoric that addresses those desires. A distinction can be made in Bacon's writings between the preparatory rhetoric, which gained such widespread European acceptance of the humanitarian goal, and the particular rhetoric required in the future which preserves some particular regime (for example, the *New Atlantis*) devoted to that goal. The one leads insensibly to the other, as is easily confirmed by our "advanced technological societies." If all philosophic publication is political action of some kind, nonetheless Baconian philosophical publication, which seems to mold humanity to seek a society in which science is the principal benefactor of mankind, is political action of an unprecedented sort. After Bacon political rhetoric almost never constitutes the particular subject matter of philosophic writings, as in Aristotle's *Rhetoric* or the *Gorgias*. Political rhetoric becomes absorbed into

the substance of philosophic speech because of the concern with the interest of humanity.

After Bacon scarcely any philosopher is exempt from the power of his humanitarian syncretism. What is properly called "Baconian" is the assumption by philosophy or science of the care and responsibility for the material and spiritual well-being of humanity, and not a narrow concern with material technology. Even those rare modern philosophers who seek to reassert the ancient speculative goal, or who seek to combat the mastery of nature in one or all forms, typically show themselves members of "the party of humanity" by proposing political societies that are founded in universal rights [as opposed to] the rarity of human excellence; or in the "inevitable" progress of history toward just social forms; or in some redemption of humanity from the nihilisms of the age. Since all philosophic attempts to save humanity from the Baconian technological mastery goal are themselves humanitarian, it is hard to avoid the conclusion that they remain Baconian in principle. The reason for this power of Baconian humanitarianism is not often correctly located. It did not require, and never possessed, the new natural science, or a new metaphysics, neither of which are found in Bacon's writings, except in nascent form. Its basis lies in no epistemology, but only in the human knowledge of misery, especially of death, and the conviction that it is ignoble not to avenge our subjugation at the hands of a niggardly nature by the exaltation of the power of man.

## 2

The immediate sense of mastery of nature in Descartes must be drawn from the one passage of its assertion, in the *Discourse on Method* (1637). We must first remove the misinterpretation of this passage that Gilson's *Commentaire* on the *Discourse* has fathered upon two generations of scholarship. According to Gilson, mastery of nature and its potential for benevolence is an accidental and unintended consequence of his philosophy that Descartes came upon after virtually all of his system was complete. This conclusion derives its plausibility from the opening paragraphs of *Discourse 6* (*Discours*, 60–62). "Mastery and ownership of nature" is introduced expressly only after Descartes "acquired general notions concerning physics," and physics had followed method and metaphysics in the canonical sequence of parts of philosophy in the *Discourse*. Descartes "notices" where these principles of physics might lead—to mastery of nature and its benefits—which obliged him to publish, since there is a "law" which obliges us to benefit other men, so far as it is in our power. Only at this juncture does Descartes for the first

and only time expressly advocate the replacement of "speculative philosophy" by "practical philosophy" of mastery of nature. Accordingly, Gilson concludes that "that which inspires the philosophy of Bacon, inspires only the publication of the philosophy of Descartes" (*Discours*, 444). Gilson's judgment would have force only if Descartes had indicated that his philosophy, prior to the discovery of the principles of physics, was directed to the speculative goal of the metaphysical tradition. But what Descartes asserts at this juncture is not the rejection of his own previous speculative philosophy, but "the speculative philosophy taught in the Schools." There is also the possibility, to be sure, that Descartes had not hitherto reflected on the goal of philosophy, and so had hitherto belonged unwittingly to the speculative tradition. But the *Regulae* (1628) virtually begins by conceiving of "the ends of study" in terms of "the guidance of action"<sup>6</sup> and *Discourse* 1 employs the criterion of "the useful for life" to condemn the whole prior tradition of learning, philosophy and theology. "Utility," so pervasive at the inception and throughout the *Discourse*, is assuredly not "mastery" but it prepares the turning to the perfection of various kinds of "masters" in *Discourse* 2, which in turn precedes method and metaphysics. Gilson failed to recognize that the utility criterion already excludes the speculative goal and thereby prepares the mastery objective. He did not envisage the possibility that discovery of the mastery potential of the physics is a realization of an original Cartesian intention, whose full disclosure was reserved until its realization became available. It would not be the first time that Descartes imputes to accident what is too untraditional to ascribe to his own deliberate design.

The initial as well as the ultimate problem we face in grasping Cartesian mastery of nature is the following. What is the measure of Descartes's opposition to the Church and its tradition, on the one hand, and to the tradition of speculative metaphysics on the other—and indeed how is the one opposition related to the other? The first opposition appears in Descartes's account of the most famous collision between the new science and the ecclesiastical tradition—the condemnation of Galileo by the Holy Office. Descartes does not name names, and does not indicate whether or not he too was a Copernican, but this reserve only supplies added force to an episode known far and wide to the learned public of the day. The question concerns the relation of religion and philosophy, not a particular scientific doctrine; he was unquestionably a Copernican, as even those who assert his invariable candor have acknowledged. He informs "the public" that he did not publish his earlier treatise on physics, either because he respected the authority of the Church over his actions, as distinct from the authority of his reason over his "thoughts," or because he feared a similar condemnation. However this may be, he replaces the authority of the Church over his actions by the authority



of the "law" which commands benevolence, mentioned before, as interpreted by his reason. This transfer of authority is dictated by the discovery of the implications of his physics for benevolent mastery of nature. He does not suggest that the Church might be the proper interpreter of the law of benevolence, or of the subsumption of his physics under that law. He does not allude to the Bible as sanction for mastery of nature as Bacon frequently had done; he openly departs from Genesis as Bacon had done implicitly. Mastery of nature will enable men to enjoy the fruits of the earth without pain "in this life." In the form of "medicine" it will conduce to health, the foundation of all human goods, and to the prolongation of life, or such victory over the grave as is available through human effort. It holds out the promise of an unprecedented practical wisdom, which we may reasonably identify with that knowledge of the use and enjoyment of the passions which Descartes calls "wisdom" at the close of the *Passions of the Soul*, his final publication (1649). The significant departures from the orthodox religions of his time are apparent.

On the other hand, Descartes often speaks as a faithful son of the Church, and presents his metaphysical theology and dualism of substance in support of Christian apologetics. The "secular coloring" of Cartesian mastery of nature in the *Discourse* seems emphatically rebutted by the metaphysics, especially when coupled with apologetic purposes in the *Meditations*. The measure of his opposition to the Church and its tradition must be judged in terms of the measure of his opposition to the tradition of speculative metaphysics. In the regnant Scholasticism that Descartes confronted, the Aristotelian speculative metaphysics was conjoined with revealed biblical theology. We must then ask some such questions as the following. In opposing "speculative philosophy," is Descartes rejecting its primary concern with the question of being or substance? In contrast with Bacon, Descartes expounds a substance doctrine of traditional type: is this legacy of the speculative tradition consistent with mastery of nature? Can Cartesian philosophy retain the traditional concern with being or substance while nonetheless regarding metaphysical knowledge as instrumental to the mastery of nature? In considering the elements of Descartes's double opposition to tradition, we take part in the contemporary discussion of the origins of modern "mastery of nature." One school, of vaguely Hegelian provenance, understands Descartes's effort as the secularizing effort of a child of his age; the other—Heidegger is its foremost spokesman—traces it to Greek speculative (especially Platonic) philosophy. These oppositions must be clarified before we can say in what measure Descartes's philosophy is a syncretic humanitarianism of Baconian type, but armed with the new instrument of a mathematicized physics.



## 3

The place of mastery of nature within the intention of Descartes must be determined within the *Discourse* and not the *Meditations*. The authoritative position of the *Meditations* in Cartesian study appears assured because of the radicality of its beginning in universal doubt, its full-fledged articulation of the separation of mind from body, and its authoritative account of the perfect deity who is the ultimate guarantor of all human knowing. Yet none of these features touches upon the end of Cartesian philosophy, about which the *Meditations* preserves silence. Because of this silence the end is usually taken to be knowledge. But the quest of the *Meditations* is for “foundations” of the edifice of philosophy or science, as laid down in the first paragraph of *Meditations* 1, and the goal of the edifice is not mentioned. The *Meditations* has the character of instrumental foundations for an unarticulated goal. On the other hand it also lacks the beginning of Cartesian philosophy. The universal doubt with which the quest for foundations commences has already presupposed the concept of the edifice to be founded, the ideal of certainty or self-evident indubitability which the foundations must possess, and above all the goal of the edifice. Moreover, in the *Meditations*, and in all its parts, the concept of nature as a corporeal world governed by the laws of mechanics is always present, often as a premise, a never doubted. Nowhere in the work is there a tincture of proof of the major ontological thesis that the essence of body is *extensio*. We must therefore allow the *Meditations* to recede from our view in any attempt to establish the structure and goal of Cartesian philosophy. The impression of autonomy, which the *Meditations* surely conveys, may be explained by Descartes’s second or auxiliary purpose in presenting the work as a self-sufficient piece of Christian apologetics, whose ostensible themes are the existence of a perfect deity, and the independent—and therefore presumably immortal—existence of the soul.

The *Discourse* is Descartes’s only comprehensive statement, published or unpublished, on the prephilosophic critique of the tradition, the necessity of beginning with a universal method, the parts of philosophy and their order, and its goal. Within the structure of the *Discourse*, the metaphysical argument, corresponding to the subject matter of the *Meditations*, is assigned a position in Part 4 clearly posterior to the critique of the tradition (Part 1), the method (Part 2), and the provisional ethics (Part 3). Our attention is therefore drawn to the criteria utility and certainty, with which Descartes judges the prior tradition in Part 1. But this double criterion has a prehistory: it develops as a criticism of the single criterion of certainty or self-evidentiality in the earlier fragment, the *Regulae*, which suggests one reason for the incompleteness of that writing. Between the *Regulae* and the composition of

the *Discourse* in 1636 Descartes all but completed the physical treatise, *Le Monde*, which he withheld from publication because of the condemnation of Galileo. It is in this pre-*Discourse* and post-*Regulae* interval that he most probably turned to the writings of Bacon in which he found the stress on utility, the arts as model of beneficence, and mastery of nature, all of which are absent in the *Regulae* and *Le Monde*, and thematic in the conception of philosophy in his first publication, the *Discourse*. The structure of the Cartesian philosophy is best understood as the attempt to unite two originally diverse lines of thinking, the mathematical science of nature of the *Regulae* and *Le Monde* and the utility-mastery theme of Baconian origin. This fusion becomes possible because the nonteleological mathematical science, despite its earlier development, is assigned the status of means or instrument of the utility-mastery goal. The idea of this fusion is the very germ of Cartesian philosophy, and the heterogeneity of its elements is in continual tension with its unification. The elements of the fusion are discernible in the formula "certainty for the sake of utility" which functions as criterion of the tradition in *Discourse* 1.

Descartes employs the standard "clear and assured knowledge useful for life" (*Discours*, 4) to judge the entire tradition of the arts and sciences, theology and philosophy in *Discourse* 1. Because certainty is given determinacy by the example of mathematics, whereas the "useful for life" remains opaque it is often not recognized that the utility goal is a decisive emendation of Descartes's intention in earlier writings. *Regulae* 2 had begun with the character of knowledge as distinct from its end: "all science is certain and evident cognition." *Regulae* 1 had indeed spoken, first of the pleasure of contemplation, and then of the guidance of the will in the contingencies of life, as "ends of study." But the universal science or method of the *Regulae* does not include good or evil or the ends of the will; the will is unrelated to the intellect; the goals of science and of the philosopher (or "life") fall apart. The "useful for life" of the *Discourse* includes production ("the infinity of artifices") as well as guidance of will; it is aided by the model of the arts, which are on the whole disparaged in the *Regulae*. The *Regulae* in its quest for certainty may be regarded as pointing toward utility—to cessation of the state of uncertainty in many forms, which is a demand for contentment arising from the side of the "subject." This contentment, which Descartes calls by the Stoic term *bonum* in the *Regulae* (*Regulae*, 2), is available only to those few capable of *humana sapientia*. Thus the *Regulae* remains "ancient" as regards the beneficiary of philosophy, and does not attain the standpoint of the useful for life which in the *Discourse* (for example, in the form of medicine) benefits man as man. Only with the *Discourse* does Descartes become humanitarian and modern.

With the abbreviated formula "certainty for the sake of utility" it first appears that certainty is the decisive element. Because they are not certain, philosophy and theology, the arts and sciences, are useless. Only mathematics is certain but its present utility is trivial; it must supply "foundations" to philosophy, which has hitherto been the source of uncertain foundations. Thus the certainty standard immediately points the way to the "mathematicization" of all branches of knowledge. Yet we must resist this conclusion, at least until certainty is brought into some relation with utility; indeed certainty and utility condition each other. "Theology" is useful as the way "to gain heaven," but it is uncertain because it lies beyond human reason, or comprises "revealed truths," and hence is useless to cultivate. Only certainty and utility in combination suffice to explain why the underlying standpoint is already "rationalism": the demand for the exclusive adherence to natural reason, subsequently expressed in the canonical sentence of *Discourse* 4: "whether we are awake or asleep we ought never to be persuaded except by the evidence of our reason." Just as the demand for a certainty equivalent to mathematics veils the underlying rationalism, so also the utility demand tends to obscure the underlying agreement with the "realist" or "selfish" psychologies of Bacon and Hobbes. Utility excludes both "virtue" sought for its own sake—the virtue of "the writings of the ancient pagans which treat of morals," the only moral writings considered—and knowledge sought for its own sake—the "speculations" of "the men of letters" or the Scholastic metaphysical tradition. Their common defect is their unawareness of the natural egoism of reason, or the pervasive power of the passions over all psychic life. Thus ancient virtue is often "insensibility" or "pride"—the attempt to be exempt from the passions which is itself passion. The "speculations" in turn are attributed to excessive self-esteem or "vanity" which plumes itself on a false superiority to the reason of "each" man, or "common sense" (*Discours*, 7–8, 9–10). The realism underlying utility thus fosters certainty, insofar as it seeks a psychological grounding in the universality of the passions, just as Hobbes and Locke found the basis of right in the allegedly universal passion for self-preservation; and the rationalism underlying the certainty requirement is broadly utilitarian in spirit.

"Inutile et incertain," Descartes's double charge against revealed Christian theology and Greek speculative philosophy, became in turn Pascal's indictment of Descartes.<sup>7</sup> Pascal seems to have perceived that no means, however certain in itself, can be certain *as a means* if the end is uncertain, and the goals of human life will always fall short of mathematically certain knowledge. Already in *Discourse* 1 it becomes clear that the utility goal can never be brought within the charmed circle of certitude—it can never be treated by "clear and distinct ideas" or by self-evident intuition and deduction.

Descartes is not guilty of the charge, often made, of universal mathematicism, of "the geometric prejudice," or of the inflexible demand for clear and distinct ideas. This mathematicism is only regional—applicable to the means where, to be sure, it is already problematic. Yet the difficulty must be stated at a deeper level within the means-end structure: even if the means, for example, a science of nature comprehensive of all natural qualities and actions, were as certain as arithmetic, it must nonetheless remain uncertain *as means* because the end lacks certitude. Mastery of nature in Descartes, precisely because it "improves" upon Bacon by making mathematical knowledge the instrument of utility, necessarily introduces an unprecedented gulf between its "means-knowledge" and its "end-knowledge."

## 4

Descartes takes the step from utility to mastery in *Discourse 2* by laying down the precept that there is more "perfection" in works accomplished by one master than in those made by many masters (*Discours*, 11). The precept is articulated by a series of examples which ascend from the prepolitical arts (architecture, city planning, and supervision) to the more comprehensive political art of the founder or legislator, culminating in the concept of a "pure and solid" reason whose *ouvrage* is a method that synthesizes logic, algebra, and geometry. In this reflection, certainty is at first absent but is then generated out of the reflection on mastery in the arts, in the form of mathematical method. The reflection of perfect mastery in the arts determines the choice of "the ways I ought to follow," that is, the choice of philosophy as the perfect life. For our theme it is of interest to observe that the mathematical method is made to develop out of the demands of philosophy as the most perfect mastery. This order can scarcely be other than deliberate, since it conflicts with the chronological order of Descartes's biographical development, as observed above, according to which the mathematical method of the *Regulae* was originally completed apart from concern with utility or mastery. The order of philosophy in the *Discourse* employs the arts to articulate the goal of mastery of which the mathematical method becomes the instrument. The turning to the arts is determined negatively by the utility standard, which had excluded ancient virtue and speculative knowledge as ends in themselves. Whereas human nature as such, or the natural egoism of reason of man as man, sufficed to exclude these ancient conclusions about human perfection, only the arts supply a model for the perfection of the highest life.

This turning to the arts reflects the agreement with Bacon: the arts are the undeniably benevolent human activity, as men generally acknowledge. Yet

only philosophic reflection on the arts lifts their benevolence above the level of opinion. Those art works which are not a plurality of diverse endeavors with diverse ends, or which proceed from one master and not several, have greater perfection. Moreover, arts that are more comprehensive are more perfect than those they include, as city planning is by contrast with the architect of a single building, or the legislator or founder of cities or peoples, by contrast with the city planner. Reason or philosophy, as the absolutely comprehensive art which provides for the goods of cities or peoples by the most comprehensive knowledge, is yet more perfect. This entire reflection largely repeats the argument of Bacon in *New Organon* 1.129, according to which arts and inventions are more beneficial and more peaceful, and therefore more worthy of honor, than the political arts, and philosophy, the art of scientific mastery over the universe, comprehends all the arts, including those of political founders and saviors of humanity, and is deserving of the highest glory. Descartes, however, asks the further question: what guarantees that the master himself is a "one" and not a "many" of passions, faculties, and goals? This question divides into the unicity of his knowing, on the one hand, and the singleness of his goal, on the other. The unicity of knowledge is satisfied by the purgation of reason of the heterogeneity of opinion, appetite, and sensation through methodical doubt; and by the "pure and solid" element of its cognition, mathematics or mathematical laws of nature. But the singleness of the goal would only be satisfied if reason were to produce its own goal out of itself, and not to receive it from a distinct and alien source, that is, from the opinion of mankind, religion, revealed theology, or inquiry into some source in the nature of man. Thus at this stage, neither the benevolence of philosophy in terms of its nonphilosophic or public beneficiaries, nor the perfection of the philosopher dedicated to perfect mastery through mathematical science, has received justification.

In the first or programmatic phase of the Cartesian philosophy—which we may identify with Descartes's reflection in the celebrated South German *poêle* in *Discourse* 2–3—these implications are stated with a certain reserve. From the same context one can easily get the impression that Descartes is unconcerned with the political, and that he thinks not of mastery but of acceptance of the world with Stoic passivity. He surely asserts that his reform is exclusively of his own private beliefs, and he denies that he seeks a "new reformation," that is, the public reformation of the beliefs on which great states are maintained which might follow were he to publish the demand for the purgation of opinion. He therefore stresses that he does not invite followers to imitate a course of action for which most of them lack the requisite credentials. In fact the world is almost wholly composed of men who lack the two essential qualifications of Cartesian philosophers, perseverance

or resolution and superior natural endowment of reason. By specifying the requirements in this exact manner, he tacitly invites the qualified to emulate him, and identifies his philosophic path as a *modèle* (*Discours*, 13–15). Moreover, this reservation to a purely private reformation of belief disappears in *Discourse* 6 when the new physics in its actuality discloses its benevolence to the public, and therewith the promise of glory to those who advance the cause of humanitarian science.

Descartes's Stoic passivity in the third moral rule (*Discours*, 25–26) also dissipates on a careful reading. He surely asserts that he will "try always to vanquish myself rather than fortune, and to change my desires rather than the order of the world." He concludes that everything but his "thoughts" is outside of his power, reminding us especially of Epictetus. However, the rule concerns those "actions" which are required while "cultivating my reason," that is, in pursuing the application of method to nature. Hence, knowing "what is in our power and what is not" does not mean, as with the Stoics, "living in accordance with nature," which for Descartes remains as yet undiscovered. It is of importance that we recognize that the Stoic rule is part of a morality *par provision*. Provisionally Descartes lived Stoically in accordance with the "order of the world," which here means only the human world of laws, customs, and religion, even while prosecuting inquiry into the natural "world." Accordingly, his account of the Stoics, who believed they had final knowledge of the natural world, that is, of what can ever become within man's power, has a decided element of satire. These ancient philosophers no more wished to be well when they were ill than they desired "to have wings to fly like the birds" or to be Emperor of China (*Discours*, 26). By such absurdities they sought to "rival the gods in their felicity" while forgetting their own mortality. They preferred a spurious superiority to common men—we are reminded of the vanity of the speculations of the men of letters—to that acknowledgment of our common, human corporeality which could spur philosophy to develop the medicine that conquers disease and senescence. Even provisionally, therefore, Descartes asserts an opinion by no means in conflict with the demand for mastery of nature through medicine in *Discourse* 6. The Stoics, among all ancient philosophers, asked the right question—what is within the range of human power?—to which only the future progress of science can supply an answer, which may always remain provisional.

## 5

This formative stage of Cartesian mastery of nature must now be confronted with the metaphysical doctrines of *Discourse* 4 and the *Meditations*.

Descartes's dualistic metaphysics has much to commend it as the appropriate ontology for the mastery of nature. We may regard the heterogeneity of the subject and object, of mastering human ego and inert, objective nature, as requiring a ground in the diversity of thinking substance and extended substance. Even this initial conclusion, however, requires a drastic revision of the speculative form of metaphysics, as distinct from its content. As indicated above, the principles of metaphysics are now understood as "foundations" of the edifice of philosophy or science, and the edifice—or "the tree of philosophy"—exists only for the sake of the goal or the "fruits." Since the *Meditations* is silent regarding the goal, we may use the prefatory letter to the *Principles* to identify the "fruits" as the produce of the highest branches of the "tree of philosophy"—medicine, mechanics, and practical, moral wisdom. Metaphysics, including knowledge of God, the highest principle, is instrumental to practice. Let us now assume that this novel, instrumental doctrine of substance could be regarded as compatible with its traditional content, doctrine of substance. Extended substance is devoid of life, self-moving organic compounds, purposes and final causes, and "secondary qualities" (in Locke's phrase)—all this precisely as demanded of the object of a mathematical physics. All such nonmathematicizable features of being are attributed to, or explained in terms of, the thinking substance, a separately existing mind or soul which has the exclusive privilege of being the autonomous source of its own activity. Furthermore, Descartes's theology is singularly appropriate to his mastery of nature goal. He knows that God is perfect, and the guarantor of the truth of clear and distinct ideas, but nonetheless cannot know the purposes of God, who is incomprehensible, in the natural world.<sup>8</sup> Physics must henceforth abandon final causes, and neither from God nor nature can be derived by rational procedures that knowledge of moral duties which might impede, or guide, the quest for mastery of nature. Rational theology is as agnostic as revealed theology with regard to human knowledge of right and wrong. The theological part of metaphysics thus furnishes the required negative sanction, the absence of suprahuman restraint on conquest of nature.

Descartes's metaphysics, summarily characterized with regard to our theme, has the following three functions. It claims to be Christian apologetics, as rational doctrine of God and the separate soul; "first philosophy" (subtitle of the *Meditations*) in the Aristotelian tradition, as doctrine of substance and first causes and principles; and "foundations" for the edifice of philosophy for the fruits of the mastery of nature. It almost goes without saying that no single metaphysical teaching can successfully perform these three heterogeneous functions without disclosing gross internal inconsistencies. The more clearly we grasp the foundations of Cartesian mastery of nature the less clearly does [Descartes] stand in the traditions of Christian apologetics and



Aristotelian “first philosophy.” In *Meditations* 6 Descartes recognized that the separate soul substance, so useful as a support for Christian apologetics, could not be brought into relation with extended substance. The benevolence or veracity of God is of no avail: there is no suggestion that the interaction of substances is or could be made intelligible. Still less does Descartes claim that the two substances, as substances, together compose one being, in the critical case of human being. Only in private correspondence does he fall back on the hylemorphic solution to the unity of man—all too obviously a prudential, “Aristotelian,” *ad hominem* argument, as is generally acknowledged. Nor is it reasonable to think that Descartes believed he could extricate himself from these difficulties by the pineal gland argument of *Passions* 1.30ff., since the very term “substance” never occurs in that work. Moreover, recent Cartesian scholarship, seeking to penetrate to the origins of Cartesian dualism, has experienced acute difficulty in finding the elements of what one could call an argument for duality of substance; not finding them in the *Meditations*, it has looked for them in any and every Cartesian writing, published or unpublished, but without significant success. These agnostic conclusions will not surprise those who observe, and follow up their observation, that the *Meditations* is devoid of the characteristics of a metaphysical inquiry into being or substance. Descartes nowhere in the six *Meditations* addresses the questions what is being, cause, substance, essence, accident, and so on, and never defines any of these terms formally or informally. If he occasionally employs them in traditional meanings, he at the same time enjoins us to believe that he has made every effort to doubt and reject the tradition, and sometimes quite explicitly indicates that he is employing traditional terms as *ad hominem* premises with which to simulate an agreement with the tradition.

The presence of gross theoretical difficulties in the substance doctrine and the absence of even an attempt to resolve them on Descartes’s part; the presence of prudential rhetoric to simulate agreement with tradition, which every scholar without exception grants in some degree; the unmistakable attempt to reject “the speculative philosophy of the Schools”—all these conspire to compel us to seek in the Cartesian philosophy for solutions to its fundamental problems that abandon the metaphysics of substance. This will seem unnecessarily iconoclastic to those who believe that the consensus of twentieth-century scholarship necessarily represents a progress over the findings and judgments of the philosophers and the learned public of the late seventeenth and eighteenth centuries. We need not fear the charge of iconoclasm if we are aware that a mind of the stature of Leibniz could declare, after four decades of assiduous study of the Cartesian writings, that Descartes dissimulated the agreement of his views on religion with those of Hobbes, and that the God of Descartes is virtually identical with the God of Spinoza. In the Cartesian writ-

ings the most sustained and searching inquiry into the problems of mind and body is the *Passions of the Soul*, in which the abandonment of the substance doctrine has already been prepared by the latter half of the *Meditations* 6.

Midway in *Meditations* 6, Descartes ceases to speak of the substance doctrine and begins a fresh inquiry into the nature of man. He draws a threefold distinction between (a) things which only pertain to mind—the sphere of “thoughts” or consciousness, established by means of the radical doubt; (b) matters which only pertain to body, which prepares the first mention in the work of “laws of nature”; and (c) “those things given by God to me as a being composed of mind and body.”<sup>9</sup> The concept of the compound here introduced is in no sense a metaphysical concept: it is not a compound of two substances, nor is it a substance itself. The compound has no metaphysical unity, nor any unity known by clear and distinct ideas, but only the experienced unity conferred on it by the sensation or feeling of pain and pleasure, especially pain. The judgment of unity inferred especially from pain is part of the “teaching of nature,” and the compound, and only the compound, is the locus of the teaching of nature whose pedagogic instruments are pain and pleasure. Looking back upon the mind and body substances, it becomes clear that it is not only their theoretical incombinability that compels Descartes’s step to the nonsubstantial compound; it is also the fact that the substances have been so defined that their combination would not permit but rather exclude an account of pleasure and pain as well as the passions. Since the *res cogitans* as thinking substance cannot, for example, become angry, but only doubt, infer, judge, reflect, and the like; and since the *res extensa* by itself is exhaustively characterized by the law of inertia and the laws of mechanical interaction and so cannot become angry; and since the compounding of such substances does not yield the least possibility of accounting for such phenomena as pleasure or pain and passions such as anger, the ground for Descartes’s turn to a non-substantial compound becomes apparent.

The natural teaching inherent in the compound furnishes him with the general foundation in human nature of judgments about good and bad. “These perceptions of sense [have] been placed in me by nature to signify to my mind what things are beneficial or hurtful to the whole of which it forms a part.”<sup>10</sup> This introduction of natural purposiveness is not compatible with nature as *res extensa*, the mechanism of body, from which purpose is excluded. Purpose is limited to the region of the compound, which is conceivable, if only on experienced and not on “clear and distinct” evidence, independently of what is known clearly and distinctly to belong to mind by itself, or body by itself. This triad enables us to say that the *Meditations* concludes with what we may call “regional ontologies” which are “metaphysically neutral” as regards substance.

This triad, and especially the compound, should not be regarded as some lapse from the "rationalism" of "clear and distinct ideas" but rather as precisely that which furnishes the mastery of nature with the basis for its distinction of means and ends. In this context the example of the dropsical patient of *Meditations* 6 is critical. From the standpoint of the mathematical science of nature, a body sick or a body healthy equally exhibits the laws of nature. But from the standpoint of the compound, that is, of human experience, a sick body is naturally defective and bad. Descartes makes no effort whatever to unify theoretically the conflict between the scientific concept of nature, which is neutral to good and bad, and the human experience of sickness which is bad by nature. Humanly experienced nature supplies the end, the goodness of health, to which only the scientific nature, in the form of medicine, conduces as the appropriate means. It is not the theoretical resolution of these antithetical concepts of nature but the preservation of the antithesis which makes possible the mastery of nature and the Cartesian philosophy altogether. The necessity of the triad for the structure of Cartesian philosophy must be remembered when one considers the attempts of the *Passions* to reformulate the relations of mind and body in a new version of the compound. The unification of the compound in terms of the operations or behavior of mind and body within "experience" is by no means the same as a theoretical unification of the compound with the other members of the triad. The disparateness or heterogeneity of the triad, it must be observed, appears only in the light of the demands of reason and is not an assertion about the nature of things. It is a conclusion fully in harmony with that rejection of the "speculative" quest for being already evident in the *humana sapientia* of the *Regulae*. "This knowledge is not the less science than that which exhibits the nature of the thing itself [*quae rei ipsum naturam exhibet*]" (*Regulae*, 37).

## 6

With these clarifications of Descartes's critique of tradition we can return to *Discourse* 6 and identify the assertion of mastery of nature there as belonging to the second of the three phases into which the project typically divides: programmatic announcement of the goal, achievement of theoretical basis, and technical implementation. In the programmatic phase, the arts are treated in terms of their historic content, the opposition to the powerful doctrines of the past is presented as a modification that is continuous with the old intentions, and the syncretic character of philosophy—its union with politics—is presented with reserve. When the laws of physics are discovered, the program comes forth into the light of day as an actualized hope, and the program is re-

vised to take account of more exact insight into its possibilities. The role of the arts as model becomes explicit at the same moment in which they begin to lose their autonomy by accepting principles from physics. "Practical philosophy" will know "the force and action" of "all the bodies that environ us as distinctly as we know the various métiers of our artisans" and "employ them in the same way" (*Discours*, 61–62). Medicine, mechanics, and moral wisdom issue forth as branches from physics, which is the trunk of the tree of philosophy (prefatory letter to the *Principles*). This metaphor is nevertheless somewhat misleading. The laws of mechanics are identical with those of physics, which Descartes envisages as identical with those of medicine, and medicine in *Discourse* 6 includes study of the dependence of the mind (*l'esprit*) on the temperament and organs of the body, as well as of bodily senescence. The effort to unify medicine, in this enlarged meaning, with moral wisdom would bring into harmony the means-end dualisms of certainty and utility, mathematical physics and mastery of nature.

The syncretic union of philosophy and politics, made explicit in *Discourse* 6, may be divided into its elements: (1) the public as well as the secular rulers of states are informed of the potential benefits, if only for future generations, of the transformed goal of philosophy; and (2) are advised that these benefits will become available only if scientific research, especially experimentation, is fostered and financed, and freedom of communication is permitted; (3) both the public and the heads of states are advised of the identity of those who must necessarily oppose the humanitarian project—namely, those who would condemn a Galileo, and in general defend the subordination of humanity to the powers of tradition; (4) the project of humanitarian mastery of nature common to philosophy or science and society nonetheless divides into a two-sided relationship, each with its duties and rights to benefit; (5) the new relationship is brought under the sanction of the "law" of benevolence; and finally, (6) the benevolence law must be supported by a framework of belief that explains the possibility of happiness, now for the first time within human power—a kind of "theodicy" that replaces the old framework of belief.

The benevolence of Descartes's project only superficially receives its justification in the law that obliges us to benefit others to the extent that it is in us. Descartes may have regarded this law as the core of that moral belief required in society at all times; certainly it is the only categorical moral obligation advanced anywhere in his writings. Yet its apparent universality is weakened by its restriction to the context of the benefits of mastery of nature. It is not mentioned in the provisional morality of *Discourse* 3 or in the many other contexts in which duty to others would seem pertinent. Our skepticism is aroused by the lack of any supporting argument or clarification of the basis or source of the law. In the various passages of *Discourse* 6 that

speak of obligation, the categorical status of the moral law is replaced by a hypothetical obligation, which may be summarized as follows. If the goal is desired—if humanity desires to receive the fruits of the mastery of nature—and if individuals desire to receive the honor and glory of benefiting humanity through that mastery of nature, then the means must be willed, the humanitarian project must be implemented. Although Descartes asserts that only those who accept this revised benevolence law have genuine virtue as distinct from mere seeming, it is better described as a precept of utilitarian hedonism than as a binding principle of moral virtue. Its force lies not in some known or received principle, but in the promise of satisfaction of desires and passions. Mastery of nature promises those benefits that all or most men and societies have always desired: the alleviation of toil, the provision of necessities always so hard won from the hands of a stepmotherly nature, the accumulation of the means of comfort and luxury, the elimination of disease, and the maximum possible postponement of mortality within human power. These benefits are as universally available to humanity as they are devoid of exacting duties or self-sacrifice. But mastery of nature promises as well a perfect moral wisdom which is peculiarly devoted to the requirements of the benefactors of humanity, the “strong and noble minds” who emulate Descartes and possess the passion or virtue of *générosité*.<sup>11</sup> Descartes apparently believed that he possessed a sufficient basis in his physics to supply the physiological basis for this virtue, the theme of *Passions*, Book 3. We must leave it at the assertion that he relies on a reformulation of ancient moral doctrines—Stoic, Aristotelian, and Epicurean—and does not utilize his physical principles to explain this highest virtue. Cartesian mastery of nature culminates in a premature attempt to pass on to the third phase of implementation.

## 7

The modern intention to master nature culminates in the problem of theodicy. This problem is invisible to many because they believe that mastery of nature is the work of science and scientific technology, as distinct from philosophy. But only seventeenth-century philosophy gave the humanitarian justification for mastery of nature, and commenced the destruction of its antecedent traditions which is often misleadingly called “secularization.” This action antedates the subsequent distinction of philosophy and science by more than a century. Only seventeenth-century philosophy laid down the principles of the modern type of political society which became the agent of technological “progress”—by merging the goals of philosophy and politics in what we have

called "syncretic philosophy." Just the utilitarian hedonism of Bacon and Descartes made their project easily combinable with the enlightened despotism and the liberal politics of Hobbes and Locke. But syncretic philosophy cannot take responsibility for the material and spiritual well-being of society without confronting the necessity of society for the overarching framework of belief which is always, if in varying degree and form, a "theodicy." This responsibility is more clearly recognized if we divorce it from the classic theological formulations it received in the biblical tradition. "Theodicy" in the broad sense here employed means accounting for the relation between goodness and the expectation of happiness, and of evil and misfortune, in terms of human activity and the suprahuman whole, be it nature or history, in which man finds himself. Kant gave an almost perfect formulation of the problem of theodicy when he addressed not philosophers but humanity with his tripartite formulation: What can I know? What ought I to do? What may I hope?

No premodern philosopher believed it possible or necessary to accept and discharge the responsibility for supplying a theodicy to humanity, as distinct from the sect of philosophers. [The premodern philosopher] customarily supported the received religion while moderating certain of its features in the direction of the philosophic account of the whole, recognizing that religion supplies that account of the whole that sanctions morality, public and private, and satisfies an almost universal human need. For this reason, the published speech of the premodern philosophers is profoundly ambiguous: even a Lucretius, who taught that the gods of the *intermundia* do not care for humanity, praised Venus to the skies.

On the other hand, modern philosophies of the syncretic type, beginning with Bacon, and continuing most obviously with Leibniz, Kant, Hegel, Marx, and Nietzsche, acknowledge, if in varying forms, the responsibility for theodicy. In the seventeenth century it is often difficult to distinguish their theodicies from the Christian apologetic theodicies they sought to replace, so that the ambiguity of their writing reminds us of premodern philosophic rhetoric, although it is nonetheless ruled by the new humanitarian goal. In Descartes the need for a new version of theodicy is by no means as clear as in Bacon's *New Atlantis*; yet we must not forget his praise of that writing in the prefatory letters to the *Passions*. In the *Passions* he seeks to defend all the passions as by nature good if rightly understood. The quest for the mastery of nature, which implies that nature is hostile, runs counter to that benevolence of nature, which even mastery of nature must premise if happiness is to be attainable through man's own natural powers, and within a natural whole that can never be eliminated. Only in the eighteenth century was it fully realized that modern scientific nature cannot be combined with an essentially premodern doctrine of the benevolence of nature, especially if

nature in itself is not intelligible, as Kant perceived. After Kant's attempt to relocate the problem of theodicy to the plane of morality, it was translated onto the plane of history by Hegel and his successors, where it found a resolution so long as history could be understood as exhibiting an intelligible pattern or *telos*, or until Nietzsche. The "death of God" may be regarded not only in terms of Christianity but as the failure of modern syncretic philosophy to replace it with a new theodicy: what Zarathustra proposes is a new goal for humanity. The problem of nihilism, pervasive of all strata of society, cannot even be correctly stated unless it is recognized as the failure of modern syncretic philosophy which believed it possible to undertake the care of humanity through the mastery of nature.

## NOTES

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